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ABSTRACT

This monograph sets forth a portion of the research and theory base underlying the organization development program, 1 of the 3 major components of the National Laboratory for Higher Education''s Administrative and Organizational Systems program. It depicts some of the linkages among organization development, institutional research, information systems, and systems theory. The overall strategy is to effect planned organizational changes that will improve the ability of the university to function in a changing world. The program focuses on the use of an open systems theory model for institutional planning and administration and on the application of management science technology. These elements are reinforced by traditional and policy oriented institutional research and computer-based information systems. The program is designed to enable university officials to create a more vital institution and a working environment that incorporates planned change as a normal or routine function of the university. (JS)

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THE APPLICATION OF OPEN SYSTEMS THEORY AND ORGANIZATION DEVELOPMENT TO HIGHER EDUCATION: A POSITION

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ADMINISTRATIVE AND ORGANIZATIONAL SYSTEMS
NATIONAL LABORATORY FOR HIGHER EDUCATION

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THE APPLICATION OF OPEN SYSTEMS THEORY AND ORGANIZATION DEVELOPMENT TO HIGHER EDUCATION: A POSITION

by

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FOREWORD

The Application of Open Systems Theory and Organization Development to Higher Education describes the research base in the applied behavioral sciences and the social sciences which relates to the pertinent portions of the Administrative and Organizational Systems (AOS) program of the National Laboratory for Higher Education (NLHE).

This is the first of three "position papers" the NLHE Senior College Division is preparing to show the documented research underlying the AOS program. Forthcoming reports will deal with institutional research and information sciences.

Addressed to education specialists and applied behavioral and social scientists, this monograph sets forth a portion of the research and theory base undergirding one of the three major AOS program components, organization development, and depicts some of the linkage among organization development, institutional research, information systems and systems theory.

We welcome comments, suggestions, and criticisms from our colleagues in the educational community, and hope they will find this report of interest.

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THE APPLICATION OF OPEN SYSTEMS THEORY AND ORGANIZATION DEVELOPMENT TO HIGHER EDUCATION: A POSITION

Problem Statement

For the past four years, the National Laboratory for Higher Education (NLHE) has been evolving a comprehensive action-research program to respond to the needs of institutions of higher education for effective administrative and organizational systems. This Administrative and Organizational Systems (AOS) program is based on a series of interrelated hypotheses about the state of society, of the university, and of man in organizations. This paper intends to support these hypotheses through relevant research and theory.

The central thesis upon which the program is based is that it is no longer possible for the university to function as a closed system, unresponsive to the pressures and needs of the larger society around it. As the United States moves toward a post-industrial state, one which is highly dependent upon knowledge, society's reliance on its college graduates causes the nature of the university to be of central concern to the entire society.

A corollary to this hypothesis is that the outside environment, impinging upon the university, is pushing for institutional change. Society as a whole is in a period of accelerating change, and is requiring the university to be responsive to that state of change. This is further complicated by the fact that demands for change are not unilateral. They

come from a number of sources, including most non-white and culturally different minority groups who demand greater entry into the system, and special efforts made to accommodate the system to their particular needs; women, married students, and others who return to the system to train for a second career; members of the new left, demanding greater autonomy and participation, according to their own felt needs; and more traditional segments of society demanding skilled workers, leaders and researchers. This demand for change is silhouetted against a great resistance to change in the university.

Implicit in the premise that the university must respond to the larger society and that the larger society is urging institutional change is the hypothesis that the university, as currently functioning, is not adequate to the requirements placed upon it. This paper explicates a number of factors leading to that inadequacy, and documents major themes in behavioral sciences research concerning the kind of change needed. These themes are that the university must understand itself as an organization and that it must develop new systems of governance, new methods for improved communication, and increased senses of personal involvement in university goals by its various constituent groups. In addition, the paper identifies the significant elements of the AOS program, the bodies of literature from which they grew, and the important contributions which this program can make to higher education.

Briefly, the program focuses upon organizational planning

and administration based on an open systems theory model, and upon the application of organization development and management science technology. These elements are reinforced by traditional and policy-oriented institutional research and computer-based information systems. The program was designed as an attempt to enable university leadership to create a more vital organization and a working environment which incorporates planned change as a normal or routine function of the institution.

External Socio-Economic Forces

Social events and social problems have always shaped the issues in higher education (Mayhew, 1970). The exterior forces which influence the college community are powerful, and often beyond the control of the university. Most potent, perhaps, of the elements which impinge on the university, has been the persistence of war. In addition, problems of urbanization, the racial situation, intergenerational conflict, the population boom of the sixties, and the information explosion have had great effect on the campus (Estes, 1966; Wisdom and Shaw, 1969).

War has been seen by several theorists and researchers (Axelrod, 1965; Levitt, 1970; Bayer and Astin, 1969; Halleck, 1968; Rubinstein, 1969), as a factor which itself has kindled many of the campus disorders of the decade. It also has served to precipitate a change in world and national political views in many young people, who question the traditional values and desire free expression of self (Shoben, 1970; Slater, 1970). The draft, the bomb, and the seemingly futile and unending war in Vietnam have instilled in many members of the current college

generation a determination to live for today and for themselves, and to get what they feel they need out of the system (Packard, 1968).

Students are demanding that courses and programs be relevant, that student participation in governance be increased, that desegregation and open enrollment be established practice (Perkins, 1970; Ikenberry, 1970a; Slater, 1970; Cox Commission, 1968; Birnbaum, 1970; Stoke, 1966; Furniss, 1969). This push for relevance and accountability (Ikenberry, 1970b; Hobson, 1971; Roueche and Baker, 1970; Roueche, 1970; Lopez, 1970), finds itself frustrated by a rampant inaccessibility in the system of higher education (College Entrance Examination Board study, Chronicle of Higher Education, October 19, 1970) and by "the archaic and isolated nature of administrative authority..." (Trimberger, 1968).

Shoben (1970) places modern culture (and, by process of inclusion, the university) within a framework by referring to two dominant forces which pull in seemingly opposite directions. These forces are ones that shaped the industrial era and ones which created a new, post-industrial revolution (more appropriately called the human resources era). The former, grounded in principles of work, production, achievement, and the delay of gratification, has long been the dominant foundation of western society. The university is deeply embedded in the industrial era. Post-industrial society, which is knowledge- and person-based, places great emphasis on personal fulfillment, need satisfaction, and non-operational goals (Elden, Goldstone and Brown, 1970; Reich, 1970). In the industrial era, there was no need to question

authority; in the post-industrial society, persons within and without organizations function by systems of shared power and earned authority (Elden, Goldstone and Brown, 1970; Trist, 1970; Shoben, 1970). Today's college students are children of the cultural revolution, some descendants and others direct participants. Their questioning of the university's value system as rooted in the industrial era has profound implications, for their values are entrenched in a different world. This makes effective communication difficult, and breeds fear and distrust. With regard to effective interaction between constituent groups (student-faculty, student-administration, or even faculty-administration), the value bases are often irreconcilable, and such a climate does not foster educational development[1] (Chickering, 1970; Veysey, 1965; Sanford, 1970; Frankel, 1968; Barnard, 1968; Slater, 1970; Ikenberry, 1970b).

These tensions--the surface symptoms of campus disorder and the implied dysfunction of the university beneath the disorder --have been so unsettling that one sociologist (Greeley, 1970) views the campus as the most serious problem the nation faces. Furthermore, results of a recent Gallup poll, which ranked the unsettled campus situation above war, inflation, and racial conflict, support his thesis. The state of the campus is a deep national concern.

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[1]Educational development is defined by Boyan (1968) as "making educational ideas and inventions work" through the iterative process which characterizes developmental work, i.e., returning to the drawing board to refine the product after pretesting, pilot testing, and field testing.

Some Major Factors Leading to Institutional Inadequacy

Granted, the university is in trouble. What are the major factors that have contributed to its current state?

One factor has already been implied, for a major determinant of the societal drift into a post-industrial era has been the effect upon the entire culture of the knowledge explosion. Western culture is essentially doubling its knowledge base every 10 years, and the impact this has had on society has been the demand for drastic social change (Toffler, 1970). This impact is most keenly felt by the university, since today the key to responding to social and technological change is precisely the ability of general and technical education to produce increasingly skilled and flexible manpower. This is rendered even more complicated by the demand by the individuals who comprise that manpower for their own right to "self-actualization, self-expression, interdependence/communality, and capacity for joy." (Elden, 1970, p. 96.)

The second factor to which research points is the population boom and accelerating enrollment in the nation's colleges and universities. In the last decade, higher education has grown phenomenally, and the rate of growth itself has increased significantly. At the turn of the century, the average faculty size at the 20 largest institutions was 255 (Mooney, 1963). The transition from the small college to the multiversity of the 1970's, where the 20 largest universities employ an average of more than 2,000 faculty, has enormous and unexplored consequences for higher education (Elden, 1970).

The growth trend of the American university seems

to be enlargement of existing institutions rather than establishment of new ones. Enrollment in universities in the 1970-71 year is 7.6 million, yet the number of colleges and universities which comprise the American higher education system does not reach 3,000 (Mayer, 1969; Grant, 1970).

Diverse Societal Roles

One ongoing situation with which the university must contend is that it has always contained, within its walls, a variety of justifiable functions. In more traditional roles, it functions to strengthen the state (Gove and Solomon, 1968), preserve and extend Western traditions (Bell, 1966), and prepare youth to staff society's professions (Millett, 1968). It also has long been viewed as the guardian or voice of truth (Newman, 1947; Brubacher, 1969). Currently, however, it is under pressure from students, some faculty, and many others in the society to move from its apolitical stance to participate in the immediate change of the existing value system (Anderson, 1970). Anderson himself contends that higher education should influence value commitments, and he is seconded by a number of other researchers who see the university as playing an important part in solving society's pressing problems (Levitt, 1970; Kerr, 1963) and as instrumental in effecting social change (Baldridge, 1970; Gardner, 1968).

The very fact that these somewhat oppositional functions must be contained within the walls of a single institution points toward the need for conflict management and resolution of communications breakdown as integral parts of

university administration.

Bell (1966), in examining the historical and future role of the university, found that in the past its primary functions were to transmit the culture and to educate the elite. As the industrial era advanced, the university took on a three-fold function: that of social ladder, training arena for the professions, and service agency. Now, once again, it is involved in significant change which should eventually lead to active involvement in shaping society. In addition to this new role, the university remains a chief determinant of the system of social stratification, a training center for job specialization, a place for continuing education, the focus of intellectual life, and the model for cultural life in the nation.

The question of first priority in terms of these diverse functions is still pondered and debated (Ikenberry, 1970a), though most researchers agree that the university must satisfy both realms and live with the tensions between them. Wilson (1965) suggests that the university might be attempting to carry out too many and too varied a set of functions, even to the point that it does nothing well.

The tendency in the university has been toward maintaining the status quo, though it seems paradoxical that the institution involving and employing those most deeply concerned with the change process is itself one of the most difficult to change. A university president, reflecting on curriculum change, once remarked that it entailed all the obstacles of "moving a cemetery" (Wilson, 1958). The barriers encountered in attempts

at changing other areas of higher education seem just as formidable.

This inflexibility in the face of demands for change is exhibited in forms of administration which have encouraged student dissent. Trimberger (1968) felt that a chief motivating force of the Columbia student revolt in 1968 was "the archaic and isolated nature of administrative authority..." The Cox Commission report (1968) also showed Columbia to be excessively authoritarian and paternalistic toward the students. Public policy was made by a very few administrators. Faculty were seldom consulted; students, never. Similar reasons are given for the student disorders at Berkeley in 1964 (Foote, Mayer, et.al., 1968; Miller and Gilmore, 1965). A closer look at the organizational structure of each individual institution as well as a scientific examination of higher education in general not only may lead to more effective management and better educational development, but also may reduce the kind of organizational dysfunction resulting in dissatisfaction and disruption.

Major Areas in Need of Planned Change

It has been established that the university must adapt in order to resolve its position as a major societal organization in the face of a plethora of significant problems: the shift from an industrial to a human resources, post-industrial era; the phenomenal increase in enrollment; diverse societal roles that the university must play, some of them incompatible with one another; and the compounding factors of inadequate systems of university governance and an institutional reluctance

to change.

It should prove beneficial now to examine the major premises about what kind of change is needed and where it finds its principal focus, bearing in mind that the internal institutional change must incorporate methods of satisfying the various external pressures upon the institution. For example, the push toward self-actualization by members of society must be reflected in the system of university administration, if that system is to be effective.

Analysis of successful organizations indicates that their structural functions, formal and informal, revolve around the achievement of stated objectives, and that organizational functioning is best examined through the leaders' perceptions of organizational goals (Sanford, 1962; Katz and Kahn, 1966). Goals formulation which involves all constituent members of an institution, furthermore, offers intrinsic rewards to all who have the opportunity to participate in the process (McGregor, 1967). It is in the light of this focus on goals definition that the remaining hypotheses become clear.

In order to define institutional goals, it is necessary to formulate the difference between "where the organization is now" (a descriptive model of the organization) and "where the organization wants to be" (a normative model). This requires a high level of self-knowledge and the ability to engage in additional self-study. Furthermore, it is necessary to develop maximum possible consensus on organizational goals and objectives if the institution is to involve its various constituents in

achieving those goals. Finally, it must then organize administratively to achieve those goals, allowing for constant revision as new data from the external environment and data concerning the process itself is received.

Basically, the university does not now follow this model of organization around goals. There is a general lack of understanding of the university as an organization (Ikenberry, 1970b; Sanford, 1962; Axelrod, 1965; Wilson, 1965b; Moran, 1968) as well as an inadequate organizational structure (Ikenberry, 1970b) and ineffective means of communication among various constituent groups. The earlier discussion of campus disorders clearly delineates the lack of consensus concerning institutional goals.

In the past, a major weakness of the system lay in the scarcity of empirical research on university organizations and in the resulting absence of any real knowledge about them (Moran, 1968). For years, the university has surrounded itself with excuses for not studying itself, e.g., its own uniqueness as an organization and academic freedom (Stumpf, 1970; Hechinger, 1970; Watts, 1970). Kerr (1963) contends that the university "has lagged in the development and application of systematic knowledge about its own processes" (italics added). Scientific investigation, however, of the processes and forms of governance and maintenance in the university is on the rise. As a recent bibliographic paper prepared by Mayhew (1970) indicates, the quality as well as the quantity of literature on higher education has shown a noticeable increase between 1965 and 1970.

It is important that the researcher keep in mind the

wide diversity inherent in our system of colleges and universities. There are vast differences in size, instructional quality, standards, governance, program variety, origin, source of support, and purpose (Stoke, 1966; Feldman and Newcomb, 1969; Wilson, 1965a). This rich variety of institutions is an administrative fact worthy of consideration (Hungate, 1964; Stoke, 1966). Stoke concludes that "understanding the differences between institutions is an important key to successful administration."

The question of leadership in an institution that defines itself in relation to its goals has been the subject of considerable study. Hodgkinson (1970) states that the primary function of a college president is to maximize "the energy available within the institution to accomplish institutional goals." Robert Hutchins once asserted that the president of a "properly administered" university should allocate to others all top executive duties in order to devote himself to the university's fundamental problems (Gerard, 1967).

The effective administrator does not use arbitrary methods of administration (cooptation), but encourages active participation of constituent groups in setting goals, deriving objectives, and creating a program, even at the cost of slower progress. He welcomes the broader scope given his program by this method (Parden, 1969; McGrath, 1970; Ikenberry, 1970b; Sanford, 1970; Gellerman, 1970; Foote, Mayer, et.al., 1968). It is therefore important for the administrator to learn to exert intelligent leadership, to earn the authority which he expects to exercise, and to act in a manner which continuously reinforces this authority (Wilson, 1965b; Sanford, 1970; Foote, Mayer, et.al.,

1968; Perkins, 1970). Conditions which exist when authority is deserved create trust, without which no system can operate (Sanford, 1970; Hodgkinson, 1970; Moran, 1968). Kerr (1963) also recommends making administration more person-oriented. This is in accord with McGregor's (1960) theory of management. McGregor feels that organizational theory must deal with both the emotional and the rational aspects of men, interwoven and inseparable. He contends that attempts to eliminate an appreciation of the emotional aspects of man in organizations are futile. The highest quality administrative decisions may not be accepted and implemented by an alienated or hostile university community. The good administrator takes this into account and bases his actions upon these expectations.

One hopeful sign pointing toward increased willingness to organize according to goal definition is the realization by academic administrators that colleges are subject to the same rules of management as are other organizations (Robinson, 1970). Disparities between educational and other types of organizations do, of course, exist, e.g., clarity of goals and objectives, tangibility of product or service, object of commitment, diffusion of decision-making privilege or responsibility (Corson, 1960), limitations placed on spending (Hungate, 1964), and source of energy renewal (Katz and Kahn, 1966). The similarities override the differences, however, and Corson (1960) suggests that, in some respects, closer approximation to business organizations could be healthy. Extreme care must be taken, however to translate these results into practices appropriate to an educa-

tional institution, rather than forcing the institution into a business mode inappropriate to it.

One hurdle that must be overcome is the opposition in academia to the "managerialization" of higher education (Brien, 1970; Knapp, 1969; Robinson, 1970). Many academicians are convinced that the university is so different from other organizations that any useful transfer would be impossible. They argue that managerial techniques inhibit initiative and creativity (Robinson, 1970). Heneman (1959) suggests that administrators who oppose the introduction of management procedures may simply lack understanding of the significance of sound management; others (Wilson, 1965b; Bell, 1966; MacLean, 1969; Brien, 1970) suggest that these resistant administrators could well be reflecting fear or insult. Both Brien (1970) and Knapp (1969) suggest methods to mesh management with education so that the institution can survive financially and realize its academic goals and objectives.

It may be useful to clarify the distinctions among governance, planning, and administration. Campus governance encompasses three major managerial functions: planning, execution, and control. Planning is directed toward determining the frame of reference for current decisions. As such, this is an integral part of and virtually synonomous with the decision-making process. The planning/decision-making function involves analyzing the current situation, identifying goals, deriving objectives from goals, formulating policies, developing effective strategies (courses of action), and allocating resources. Execution is, of course, the process of carrying out the planned actions by those

responsible for achieving agreed-upon results. The control function is the measurement (summative evaluation) of progress toward and achievement of specific institutional objectives. Properly considered, the administration of an educational institution performs these managerial functions, with appropriate paritcipation and support from faculty, students and other major constituents (Corson, 1960; Foote, Mayer, et.al., 1968; Hungate, 1964; Green, 1969).

Review of the literature suggests that the university must reorganize itself to respond constructively to nine major trends:

(1) Increased enrollment and the belief that a college education is no longer a privilege, but merely the next step after graduation from high school.

(2) Increasing costs of education, a consequent move toward low-cost public education, and a rise in societal demands for cost-accountability.

(3) The rise of professionalism and departmental power.

(4) Societal concern with the importance of each human being, his self-actualization, and the quality of life in general.

(5) The shift of the campus to a pluralistic community.

(6) Conflict over goals; i.e., various constituent groups disagree on means and ends in higher education.

(7) The change in students; they are today brighter, more sophisticated, and less bound by tradition than ever before.

(8) The influence of students as member of faculty,

administrative and board committees.

(9) The growing desire for more effective methods of governance (Perkins, 1970; Ikenberry, 1970b; Chronicle of Higher Education, October 19, 1970; Jacob, 1957; Kavanaugh, 1968; Frankel, 1968; McGrath, 1970; Corson, 1960).

Organizational Focus Through Goal and Objective Definition and Achievement

The basic need suggested by these findings is to implement in the university a system of planning which continuously receives information from many sources and processes that information in such a way that its constituents benefit. That is, they participate actively in the growth and change with understanding, maximum agreement, and continued support. Administration would focus on successful implementation of the policies and procedures developed. Again, the need for self-study and a sophisticated use of information gathering and compiling facilities is paramount.

The emergence of systems theory upon the academic scene, coupled with the utilization of institutional research and information science in the planning process, and the use of organization development theory and management science techniques, provides extremely useful tools with which the university can begin to restructure itself to meet the demands upon it.

Systems theory will be briefly described as well as its possible application to the university and its relationships to institutional research, information science, and organizational development as they can be utilized in creating a responsive organization which incorporates planned change into its structure.

Systems Theory

A system is generally defined as a set of interrelated elements designed to accomplish a goal or objective. A basic assumption of systems theory is that the total of those parts differs in significant respects from the parts taken separately, and that the interaction of elements is crucial.

Systems theory is concerned with matters of structure, relationship, and interdependence, and the newer formulations of systems as "open" rather than "closed" offer models highly adaptable to social organizations (Katz and Kahn, 1966). Basically, an open system engages in mutual information exchange with other systems in its environment and depends upon these transactions for its equilibrium; if it is complete within itself, it is described as closed. A highly adaptable human being is a good example of an open system. Educational institutions can be studied usefully as open system models (Sanford, 1962; Ryans, 1964; Gerard, 1967; Cook, 1968; Johns, 1969).

Systems theory has special application to the decision-making process in that it attempts to describe all alternatives and evaluate their consequences, so that a decision may be made which has the highest probability of providing the most preferred outcomes (Bell, 1966; Parden, 1969). This approach seems especially

desirable where a choice must be made between a number of different alternatives and under conditions of uncertainty--the situational norm of the university (Parden, 1969; Hills, 1967; Lyden and Miller, 1967).

Communications is a key concept in systems theory. In education this approach relates to the handling and processing of information as well as to its introduction into and its departure from the system. Systems theory, applied to higher education, can explicate the conditions for healthy information exchange so that operations are improved and the path is cleared for the achievement of educational and institutional goals and objectives (Dorsey, 1957; Ryans, 1964

According to Carter (1969), systems theory has particular applicability as a tool in planning and administration because "it places much emphasis on the problems of implementation, evaluation, feedback and revision... and) it forces decision-makers to face up to the problems at the implementation end."

Although no comprehensive, wide-scale projects implementing the systems approach exist in the realm of education (Monroe, 1969; Ryans, 1964), a few recent attempts presage its usefulness to the university. Efforts are being made at Wesleyan University, Michigan State University, the University of California, St. Louis University, the University of Hawaii, Santa Clara University, and the University of Houston[2] (Brien, 1970; Parden, 1969;

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[2]The Brien (1970) article describes in detail what has been done at one institution--the University of Houston. It is available upon request from the National Laboratory for Higher Education, Mutual Plaza, Durham, North Carolina 27701.

Etherington and Vancil, 1969; Koenig, et.al., 1966). The systems approach has also been successfully applied to instruction (Roueche and McFarlane, 1970; Roueche and Herrscher, 1970), school building construction (Miller, R., 1970), and counseling and guidance (Miller, J., 1970; Hosford and Ryan, 1970).

Sufficient preliminary forays into the arena of planning and administration suggest that the systems approach organizational renewal may well be applicable to the full range of administrative structures found in our nation's sytem of higher education--from a small department in a community college to the campus-wide organization of the multiversity.

Applicability of Systems Theory to the University

Systems theory seemingly provides people with the potential to make sense out of a number of the problems with which the university must cope, including those in the greater society (discussed previously).

According to systems theory, the university is surrounded like any other open system, by certain constraints; e.g., limited physical facilities and financial resources, and externally imposed pressures and regulations. These constraints "provide the constants of the environmental framework within which the system must operate" (Huff, 1969).

An organization cannot operate indefinitely without making some changes in its system components. The desideratum of every system is to maintain an equilibrium, a state of balance among all external and internal forces operating to influence the

system. If it is to survive, it must achieve, restore, and/or maintain equilibrated conditions; it must learn from its environment, through the feedback process (Johns, 1967; Chin, 1961; Ryans, 1964; Bertalanffy, 1950; Hills, 1967).

Feedback is defined by Lonsdale (1964) as "the input from the environment to the system telling it how it is doing as a result of its output to the environment." The effect of the system's output is fed back into the system as an input (Hill, 1963). Positive feedback encourages the system to continue along the same lines of functioning and to make more of the kinds of changes it has been making. Negative feedback disturbs the system and challenges it to adjust itself or its output. Receptivity and response to feedback characterize a flexible, viable institution, one which is capable of adapting to an ever-changing environment (Johns, 1967; Ryans, 1964). Feedback as well as other concepts of open systems theory apply also to the student in the process of learning.

An organization which uses the feedback it receives to direct its course is said to operate, much like a thermostat, according to the principles of cybernetics. "Cybernetics," a Greek word meaning "steersman," was coined by Weiner (1948) to refer to the field of control, communication, and feedback theory. The concepts of this science help the organization to become self-regulating and to remain in tune with its environment (Hill, 1963; Ryans, 1964; Maruyama, 1963; Barlow, 1968). In addition, studies have demonstrated that, with regard to human relations and social systems, the feedback process increases interest

(Pryer and Bass, 1959), develops mutual understandings (Festinger, 1950), and improves the total communication process (Leavitt and Mueller, 1951).

Proponents of the systems approach seem to be in relative agreement with regard to its objectives. Purposes accomplished by these procedures are as follows:

(1) Cultivation of a clearer understanding of the dynamics and operations of the institution (Huff, 1969; Millett, 1968).

(2) Effectiveness and efficiency in the control of functioning systems and in the design of new systems in order to reach goals (Ammentorp, Daley, and Evans, 1969).

(3) Attainment of optimum performance in terms of resources (Burchfield, 1968).

(4) Formation and/or expansion of information base for decision-making (Millett, 1968).

(5) Promotion of rationality as well as reduction of confusion and uncertainty (Millett, 1968; Ammentorp, Daley, and Evans, 1969).

Human beings are naturally reluctant to embrace anything new, so it is not surprising that systems management has encountered resistance. Very few people are conditioned to think in a systems manner. Application of this approach to educational problems, therefore, requires changes not only in behavior, but also in mode of thinking (Parden, 1969; Cook, 1968). Reaction to the systems concept, however, demonstrates itself in many other forms. A few of the potential resistance factors are the following:

(1) Mystique and intimidation resulting from the terminology and jargon which accompany systems processes.

(2) Non-availability of relevant data.

(3) Effects of power politics involved in making decisions about resource allocation.

(4) Difficulty in reading agreement on variables to be observed.

(5) Problems of authorization and control.

(6) Vested interest.

(7) Critical claims, e.g., systems analysis is too intellectually analytic, rather than empirical and experimental, the methods are questionable because of unstated assumptions, etc. (Brien, 1970; Carter, 1969; Carden, 1969; Cook, 1968).

Steps in Systems Analysis

Though there are various interpretations of the manner in which systems analysis is accomplished, there is relevant agreement with respect to the steps to be followed.

Huff (1969) states that a prerequisite to the initiation of the new management techniques is for all those engaged in the decision-making process to view the organization and its environment as interrelated systems and to comprehend the implication of the relationships among elements and components of the system. Following this, the phases of the process are outlined below:

(1) Generation of institutional profile. This step involves the development of a "descriptive model" of existing conditions of the organization, e.g., size, type of institution, strengths, weaknesses, traditions, structure, etc. Included in

this body of data is an account of the institution's needs and goals.

(2) Statement of Objectives. Presumably, an institution satisfies its needs through the achievement of institutional goals and objectives, since these indicate its desired future profile. Therefore, the specification of objectives creates a "normative or deterministic" model. It is this model that guides the organization in planning and administration. The remaining steps are concerned with discovering the best route from the current situation (descriptive model) to the projected state (normative model).

(3) Proposal of alternative systems. There will always exist a multitude of possible paths to a desired goal and its subsumed network of objectives. In order to choose the most desirable path, it is necessary to generate a list of the alternatives. Necessary to the completion of this state of the process is a knowledge of functioning and/or theoretical systems, innovative thinking, creativity, and candor. All possible action solutions should be formulated. Each option may itself include alternatives in time and cost.

(4) Collection of information. The data acquisition stage consists of gathering all relevant facts, in terms of needs, constraints, and resources, pertaining to each alternative strategy. This information is compiled and organized. Institutional research in its broadest sense, and computer-based information systems are extremely helpful.

(5) Comparison by modeling or simulation. A model of the situation is an attempt to take into account some of the

cause-and-effect relationships bearing on the problem under examination. The comparison of proposed courses of action may be accomplished manually by mathematical equations or mechanically by a computer program. Management science has provided useful tools such as PERT, PPBS, and cost/benefit analysis. Outcomes of this procedure are estimates for each option of costs, performance, timing, risks, effectiveness, and extent of goal achievement.

(6) Selection of best alternative(s). It is recommended that a criterion be employed by which to rank in order of desirability the alternative strategies or policies, thus providing a standard by which cost is weighted against effectiveness. Generally, choosing involves compromise. (Huff, 1969; Carter, 1969; Quade, 1964; Burchfield, 1968; Brien, 1970).

To these six major steps, Carter (1969) adds four more activities to complete the cycle: implementation of the selected alternative(s), evaluation of the new system, feedback, and modifications. Consequently, these steps are similar to the phases of the "educational development" process, adopted by the education laboratories across the country.

Gellerman (1970) and McDonald (1960) agree that an organization is more effective and efficient when each member is able to plan and live his life in a style which offers him meaning or satisfaction and simultaneously serves the organization's goals and objectives. He, therefore, feels it is necessary to consider the interdependence of all components of the system and the whole, and to anticipate the effect that an alteration in one part of the

system (including the personal elements) will have upon the whole and the other parts. He places great emphasis upon a good organizational climate, commitment to the organization's goals, and shared information about goals, objectives, results, norms, etc. Furthermore, he feels that the setting of institutional goals and objectives should take into account personal life goals as well as work goals, thereby helping the institution's constituency to feel that it has created the program and those who work within the institution to feel "that their work serves their life rather than vice versa...that feeling of personal effectiveness means maximum motivation" (Gellerman, 1970).

Institutional Research in Support of University Systems Applications

The overwhelming need for self-knowledge of the university as an organization expressed by Ikenberry (1970a; 1970b)finds its satisfaction in an attempt to use systems theory as an instrument in planning and administration, since the theory is dependent upon accurate, detailed, and timely information. These needs can be met through the use of applied institutional research.

Institutional research (IR) is defined as the investigation, within an institution of higher education, of educational problems and/or issues of current concern to that institution. The objective of institutional research is the improvement of institutional functioning (Cowley, 1960; Brumbaugh, 1960; Doi, 1963), and its major contribution has been in the area of decision-making, which traditionally has rested on opinion, personal experience, or intuition (Doi, et.al., 1963).

The IR movement began in the late 1950's when the

American Council on Education stimulated interest in it by keeping administrative officers informed with regard to institutional programs and operations (Corson, 1960). It was hoped that the results of scientific investigation would help convince them of the need and justification for change (Horn, 1962). The impact of IR on the educational scene has been less than startling, however, and a coordinator of institutional research is still the exception rather than the rule on the college campus. Planned change based on the findings of institutional research is still more rare. Cross (1967) and Boyer (1967) both suggest that the explanation lies in the meager evidence of the institutional researcher's effect upon the academic program. It appears that every aspect of college life has been examined by the institutional researcher except his own contribution. Perhaps an even more compelling argument suggests that institutional research typically has not been directed toward policy questions. Regardless, an open systems approach to decision-making requires the capabilities of the office of institutional research, and may well provide the focus currently lacking to the operation of that office.

As indicated earlier, both the process of data collection and the definition of alternative strategies require the services of the institutional researcher. Much work in the form of data collection, processing, and presentation must take place prior to an informed decision. In many cases, access to a computer is virtually a necessity. Though many small colleges are capable of operating according to systems principles without the aid of computers (Robinson, 1970; Burchfield, 1968), most large universities would find it impossible to handle manually the vast amount

of data accumulated for the purpose of making one complex decision (Huff, 1969; Gerard, 1967; Glover, 1970; White, 1970; Dobbins, 1970).

One procedure useful in the development of alternative strategies is called computer simulation. It allows a rapid examination of those alternatives. All relevant information pertaining to the decision which must be made is fed into the computer, and the model "simulates" the real-life conditions for each alternative situation. A computer process known as interation (repetition) then permits projection into the future, allowing anticipated results of alternative programs to be summarized iteratively on a year-by-year basis, so that costs, risks, effectiveness and other outcomes may be simulated years in advance (Etherington and Vancil, 1969; Huff, 1969; Judy and Levine, 1969; Brien, 1970). Simulation allows comparison of considerably more than two conditions, as is the general case in traditional statistics (Ammentorp, Daley and Evans, 1969). It also permits more than one solution to a problem, thereby allowing the administrator control over and responsibility for final judgments (Gerard, 1967; Huff, 1969).

Organization Development

The argument to this point has established the following:

(1) The university needs to change.

(2) It needs to incorporate diverse and potentially irreconcilable elements.

(3) It must develop mechanisms for determining institutional goals and objectives and for moving toward their accomplishment.

(4) These institutional goals and objectives must interface with the personal goals of its various constituencies.

(5) The university must lend more consideration to political and interpersonal matters, since these are more potent in determining organizational affairs than is generally realized.

In the face of present conditions, how can these needs be satisfied and change facilitated?

While it does not offer itself as a panacea for the world's organizational ills, organization development (OD) theory and practice does attempt to deal with the interpersonal structure and process of groups and organizations and to assist them in moving toward goal realization. Gellerman (1970) states that the objectives of OD are simply "to get all the parts of an organization moving in the same direction."

McGregor's (1960) Theory Y assumes that men, if given the organizational opportunity, like to work and are capable of self-motivation and self-direction; and, therefore, that organizations which encourage an atmosphere of open, trustful communication, goal sharing, and shared decision-making will benefit their members and achieve greater realization of organizational goals. Based on these premises, OD operates to realize a number of goals in terms of organizational functioning, including those of cooperative group relations, maximum agreement, open communication, high collaboration and low competition within units and flexibility (Beckhard, 1969; Morse, 1968). In general, it increases the institution's ability to solve problems, make decisions, and act in a concerted manner to implement those decisions (This, 1970).

As such, it can be a boon to both the planning function of the university and its administrative operations.

A broader view of OD is defined by Bennis, who suggests OD is necessary whenever social institutions are competing "for survival under conditions of chronic change" (Bennis, 1969). He sees change as "the biggest story in the world today," and says that OD is "a response to change, a complex educational strategy intended to change the beliefs, attitudes, values, and structure of organizations so that they can better adapt to new technologies, markets, and challenges, and the dizzying rate of change itself."

Bennis tends to concentrate upon the "people variable." Lippitt (1969, 1970), on the other hand, includes the strengthening of non-human as well as human resources in his notion of the concept. In either event, the process of OD, involving such specific strategies as team building, conflict management and resolution, goal-setting and planning, tends to lead to a goal-oriented, self-renewing organization (Beckhard, 1969), and OD is today accepted and respected as an approach to create highly viable organizations that are responsive to changing societal conditions (Bennis, 1969).

The coalition of McGregor's theory of organizations and Gellerman's conviction that it is necessary to consider persons as propitiate to any systematic analysis of an organization strengthens the need to consider organization development techniques as part and parcel of any applied systems analysis at a university.

Organization development also is relevant to a systems theory of planned change for another reason. In order to be employed, it assumes a willingness to apply methods which, when

initiated by top management and designed in cooperation with constituent members of the organization, facilitate progress toward goals and objectives. OD is always conducted for the purpose of solving problems as defined by the members of the organization, and is therefore a highly goal-oriented intervention in group process and institutional dynamics (Burke, 1971). As such, it complements systems analysis and an open systems interpretation of organizational function and organizational change.

Current trends in OD theory indicate that it is beginning to come to terms with the politics of change, the reality of power, the utility of conflict, and the absence of value consensus. It is beginning to work with differences in "power, values and ideologies rather than just love, trust, and support." (Elden, Goldstone and Brown, 1970, p. 88; Bennis, 1970). All these have been pervasively present as covert themes in earlier discussions of the forces in society and those within the university pushing toward change.

Summary

The discussion has attempted to demonstrate that the college scene today is one symptomatic of an institution "embroiled in change" (Corson, 1971). Symptoms include campus confrontation, resignations of presidents, rising financial difficulties, demands for societal accountability and institutional relevancy, etc. These evidences of dysfunction are related, it was stated, to the major impact of the knowledge explosion, the post-industrial era, and the population explosion--which has caused increased entry into the university by students and a more diverse student body

than ever before. It was established that the university must deal with societal conditions of ongoing, accelerating change--that this is the state of the world and that the university cannot remain isolated and survive. It must function as an open system and incorporate into its own structure a continuous process of responsive, planned change. Research findings were stated that suggest that organizations, in relation to a changing world, make the best use of their members by functioning according to institutional goals and objectives, by sharing goal and objective setting and decision making processes as much as possible, by integrating individual goals with organizational goals, and by devising methods for coping with breakdowns in communicaitons and internal conflict.

The thoery of open systems and systems analysis has been proposed as a useful tool for devising a program of planned change. It has been suggested that, in order to use systems theory adequately, a base of detailed,accurate, timely information and the ability to process information rapidly are necessary. In addition, traditional and policy-oriented institutional research and computer-based information systems were advocated as effective means of fulfilling those needs.

Finally, support was given for organization development theory and skills to help integrate programs of planned change. OD allows organizations to deal with the process of organizational interactions, especially in relation to interpersonal and intergroup process.

In the following section, the program developed at the

National Laboratory for Higher Education (NLHE) is described. This program was designed in response to the set of premises about the university's need for new and improved organizational and administrative systems. The program designed by NLHE strives to enable universities to be sensitive and responsive to internal and external pressures, and to maintain their institutional integrity and academic relevance in a changing society.

The Administrative and Organizational Systems (AOS) Program

Basing its design on hypotheses examined in the first part of this paper, the National Laboratory for Higher Education (NLHE) has developed an Administrative and Organizational Systems (AOS) program to assist colleges and universities in introducing a continuous process of institutional development which facilitates normal administrative operations and supports constructive, rational, and orderly change. AOS is the first known attempt to synthesize the knowledge bases of organization development, organization theory, management science, systems theory, and institutional research into one comprehensive approach to administration and organization in institutions of higher education.

Basic Premises of the AOS Model

The AOS program rests on three basic premises. The first premise, in brief, strongly suggests that the complex nature of higher education demands an open systems approach to understanding of self in relation to a complex society and relevant decision-making. It states that the educational process, organizational structures, and administrative operations of colleges and universities are so complex that it is difficult for them to keep abreast of change without adequate procedures for comprehensive planning and decision-making based on research; systematic setting of goals and objectives; methods for allocating human and financial resources in line with goals and priorities; and continuous evaluation and modification of plans, programs, and processes. By using the open

systems approach to organization, planning, decision-making, and evaluation, it is believed that a college or university can achieve a higher degree of educational and financial accountability than it has been able to do in the past and be more responsive to a changing world. The second premise is that the sine qua non for newer systems of governance is constituent involvement and that increased constituent involvement leads to an increased sense of personal commitment to the goals and objectives of the institution. There are now procedures which will allow for effective participation in institutional governance by faculty, students, administrators, and other key constituent groups. Research techniques for collecting and analyzing data for decision-making are available. Equipment for storing, retrieving, and analyzing information exists on most campuses or is available through cooperative or service arrangements. The third premise is that the complexities of the change process require an on-campus catalyst In order to accomplish institutional self-understanding, develop new functioning systems of governance, improved communications, and increase personal involvement in these goals and objectives by constituents, an organizational specialist[3]

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[3]Schultz, J., and Winstead, P. The educational development officer: A catalyst for change in higher education. National Laboratory for Higher Education, Durham, North Carolina, 1971.

is necessary. The literature and experience indicate that it takes more than institutional research and computer-based information systems to manage an organization by goal setting and achievement. As in any other organizational effort, it is the human element and the human relationships that are crucial. Among the necessary ingredients are those involving acceptance of responsibility, the ability to make decisions based as much as possible on the results of objective research, and the need to understand clearly the goals of the institution. Necessary, too, is the development of trust, institutional communications skills, and ways to maintain formal and informal communication links. The AOS concept, therefore, hinges on the appointment of a full-time planned change specialist and the commitment of the president and governing board to making the system work.

AOS Strategies

The AOS program consists of a set of planning and decision-making processes and is comprised of three major components: Organization development, information systems, and institutional research. It is viewed as a total system and is applicable to any institution of higher education.

The over-all strategy of the AOS program, then, is as follows:

(1) To stimulate planned organizational change in institutions of higher education.

(2) To encourage change based upon goals and objectives established through the maximum agreement (consensus when possible) and integration of the needs and interests of

the institution's constituent groups and individuals comprising the groups.

(3) To establish the means for institutions to gather and communicate the information they need to derive their objectives from goals, to form their plans and procedures for change, and generally to function efficiently.

(4) To incorporate the open systems approach as the primary vehicle for identifying change needs and goals.

Three Major Components of the AOS Program

The AOS program rests on three major components:

(1) Organization Development (and management science)

(2) Information Systems

(3) Institutional Research

The over-all strategies of the Organization Development component are to provide the means to establish goals and objectives and to undergo consequent change through management-by-objectives and participative decision-making, and also to promote the installation of an internal change agent to facilitate these changes. The strategy for the Information Systems component is to provide the tools and techniques for the gathering and communication of information prerequisite to the AOS systems approach to organizational development. Strategies of the Institutional Research component are to provide means for determining information needs and designs for attaining the information, to summon resources for research-based decision-making, and to provide the means for training those internal change agents and other key personnel in the techniques of institutional research, development, and evaluation.

Before examining the three components of the AOS program in more detail, some attention should be given to the concepts of change and planned change, lest it appear that the program functions from a simplistic base of "change is good." Many administrators suggest that terms such as "planned change" or "change agent" are inadvisable in that they make a value of change *per se*. On the other hand, to give the benefit of the doubt to change and to create special mechanisms to promote it simply recognize generic tendencies of complex organizations to move toward an irrational *status quo* based on bureaucratization. Planned change assumes organizational lag and sets up mechanisms to counteract it. Change capacity itself, therefore, should be one of the most important goals for institutions of higher education.

This is especially true since the literature on higher education has often argued that the university is one of the institutions in society least amicable to change. The literature points to the stabilizing impact of guild-like disciplinary loyalties, tenure, weak leadership structure, traditions, and reactionary boards of trustees (Rudolph, 1962; Sanford, 1962; Gardner, 1964; Gross, 1963; Hill, 1963; Kerr and David, 1969; Evans, 1968). Based upon the current need for universities to be responsive to the needs and pressures of the wider society and upon this endemic reluctance to change, the search for ways of incorporating planned change seems justified. These developmental activities are especially important when compared with the very costly process by which unplanned changes are forced upon an unprepared institution.

The Organization Development Component[4]

The systems approach proceeds from the establishment of goals, attainment of maximum consensus regarding the goals and their consequent objectives, and management on the basis of these objectives. Whatever the organization, it is inconceivable that it could function effectively without reference to its goals. Indeed, the hypothesis has been supported by research that one of the reasons for the current disturbance in the university is the lack of articulation and consensus on relevant goals and objectives.

Therefore, a primary goal of the Organization Development component is to provide means for institutions themselves to formulate appropriate and desirable goals and objectives. A corollary goal is to provide means for an institution to integrate effectively the needs and concerns of its constituency with its goals. The institution's constituency generally includes trustees, administrators, faculty, students, alumni, employees, benefactors, and the community. To maintain a reasonable scope of work, however, the AOS program will initially concentrate upon students, faculty and administrators with these objectives in mind:

(1) To establish, clarify, and obtain constituent support for institutional goals.

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[4] It should be noted that some writers on organization development define organization development as a synonym for planned change and include most elements of management science in their organization development approach (Beckhard, 1969). For more detailed discussion see Shultz and Winstead, op. cit.

(2) To derive measurable objectives from established goals, to assign priorities to the objectives, and to gain consensus from constituent groups regarding the objectives and their priorities.

(3) To determine the activities required by the objectives, to determine the institutional components best able to undertake the activities, and to determine organizational responsibility accordingly.

Major product areas relating to these objectives include: The Institutional Goals Inventory (IGI) and a resultant Institutional Objectives Data Bank, and training packages for deriving measurable objectives.

The second goal of the Organization Development component is to develop an effective model for participative governance. This entails integrating the needs of individuals and the institution, fostering a democratic style of decision-making (including the allocation of responsibilities and resources), and facilitating open and accurate communications among constituent groups. The objectives, although elusive, follow from those of the first goal. They are as follows:

(1) To increase responsiveness to needs and concerns of diverse institutional constituencies.

(2) To define responsibility for objectives and delegate decision-making authority democratically.

(3) To establish management teams to allocate resources consistent with objectives and priorities under their administration through a Program Planning and Budgeting System (PPBS).

(4) To communicate among constituent groups problems, alternative solutions considered and selected, and the effectiveness of alternatives implemented.

(5) To encourage constituents to participate as voting members on major councils, committees, and other major decision-making bodies.

Major product areas relating to these objectives include: Training materials for initiating management-by-objectives, mechanisms for developing representative planning groups, and the development of action-research teams.

The third goal of the Organization Development component is the development of the function of the Educational Development Officer (EDO) as an institutional change agent.

Goals Definition

Delineation of goals is probably the most widely accepted and least questioned principle of any work unit which must be planned (Ohm, 1966; Newman, 1960; Gross, 1965). A clear statement of the goals of an institution forms a basis for organizational functioning; it provides a set of guidelines for setting priorities, generating strategies, and evaluating products and services.

An understanding of purpose and ideology by everyone concerned is essential to a sound organization. Many researchers suggest that widely-shared goals could fill the void left by the de-emphasis of institutional "loyalty" and could become the unifying force of the university (Berkeley report, 1968; Otten, 1968; Bell, 1966). Yet educational goals are often too global, implicit, inconsistent, or idealistic

to make possible the conversion of decisions into action (Newman, 1950; Umbeck, 1970; Katz and Kahn, 1966, Judy, 1970). Broad institutional goals must be broken down into sequences of subgoals or objectives and described in sufficient detail so that they can be quantified (Robinson, 1970; Newman, 1950; Smith, 1969; Elkins, 1970; Millett, 1968; Dyer, 1969).

In line with this mode of thinking, the AOS program calls for the derivation of specific objectives from the more general goal statements. These objectives are "dynamically quantified," i.e., operationally defined in behavioral terms and provided with appropriate performance indicators so that they can be measured and be subject to revision and change. Program outcomes may then be evaluated against a criterion which accompanies the particular objective under test. The objectives thus become results by which the over-all functioning of the institution can be determined by quantitative and qualitative evaluation. Appraisal of these dimensions provides an index of profitability in its broadest societal sense.

Additional considerations of goals/objectives description are the following:

(1) Everyone concerned must be made aware of these institutional and program objectives and of the relationship between his own personal-professional needs and existing expectations about his performance. He should know the performance standards by which he, as well as the institution, is to be evaluated (Elkins, 1970).

(2) Objectives of organizations are dynamic. They change as the environment changes (Sanford, 1962). Consequently,

the goals, objectives, and related assumptions of a single institution should be reformulated periodically. In addition, feedback should be continuous so that when the goals are re-examined, modifications are determined in part by the feedback. Thus goal setting, objective specification, and assumption development[5] are seen as an ongoing, unremitting, self-renewing process.

Institutional planning is carried out with the full knowledge that the future cannot be predicted with accuracy. Resulting plans, therefore, are only approximations of the future.

The Institutional Goals Inventory

The Institutional Goals Inventory (IGI) was developed and pilot tested by the Educational Testing Service with the support of NLHE for the Laboratory's AOS program to meet the need to derive institutional goals and to move towards goal consensus. It makes use of the Delphi technique developed by the Rand Corporation to define underlying patterns of consensus among constituencies which hold widely divergent views. The technique consists of repeatedly administering the same series of questions to the sample group, and with each repetition revealing how the various groups responded previously. This technique has resulted in a modification of views among divergent groups, leading progressively toward convergence of opinion and increased understanding of different viewpoints.

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[5]As assumption is seen by management experts as "a temporary hypothesis regarding a very important probable development that cannot be predicted with accuracy and over which you have no significant control" (Greene, 1969). Assumption development refers to the process of expressing assumptions explicitly and clearly so that any change may be easily detected and measured.

The training package accompanying the IGI contains self-instructional materials for establishing, clarifying, and obtaining constituent support for goals. The Institutional Objectives Data Bank will accumulate an array of goals, objectives, and activities. Institutions participating in the AOS program will be provided with prototype data from other institutions in the form of alternative goals, objectives, and strategies, and for training personnel in developing and accomplishing objectives.

Management-by-Objectives

A second program developed under the Organization Development component confronts the immense management task facing the president of a large university. Although consolidating administrative power into one individual is both impossible and undesirable, it is possible to coordinate and monitor the results of diffused leadership. This is accomplished through making every employee aware of the institutional goals and objectives, as well as policies and preferred procedures for attainment of objectives, and through evaluation of the various work units--departments, divisions, components, branches, schools--by those criteria (Odiorne, 1970; Drucker, 1954; Likert, 1961; McGregor, 1960).

These principles are embodied in a system known as Management-by-Objectives (MBO). It is described by Odiorne (1965) as defining outputs in terms of objectives and applying these output statements as standards by which to judge the quality of activity. The AOS program intends to develop and to introduce into the university a simple, practical, and

flexible planning process which encourages the intelligent and active participation of all personnel. A few of the benefits that are likely to result from these programs are:

(1) Reduction of the tendency to begin work toward momentarily clear goals but to lose sight of these longer-term goals as one becomes deeply enmeshed with here-and-now activity.

(2) Increased awareness of goals and related objectives, a condition which has been found to be associated with successful organizations.

(3) Improvement of individual and over-all organizational functioning (Odiorne, 1965).

Installation of a management-by-objectives program should augment the institution's capacity to realize as fully as possible the potential of its human resources, and to encourage its members to realize their own potentials as well.

Educational Development Officer

The AOS program presupposes that organizational change is most likely to be effected if the systems approach is supported by those in high-level administrative or leadership positions (Gellerman, 1970; Brien, 1970; Holmes, 1970). The need in modern organizations has been documented (Katz and Kahn, 1966) for a person (or group) who faces inwardly, as well as outwardly, who is constantly aware of the survival requirements of the system in a changing environment, and who is concerned primarily with problems of adaptation. Such a person would deal with change, the management of change, and ways to cope with the complexities of most institutions

of higher education. As a catalyst for sound institutional advancement, he would help establish a climate conducive to maximum productivity by all those engaged in the educational process on campus. He would attempt to ensure that the administrative and educational decisions being made are based, with the involvement of appropriate persons, on intelligent procedures and on the best research and experience available. Such a role has emerged and has been formalized in various organizations within industry, government, and service agencies. The AOS program stresses the need for this role in higher education.

The AOS program introduces a special staff position, that of the Educational Development Officer (EDO). Walton (1969) has described third party attributes which suggest generalizable features of the EDO.

"...the following five role attributes...can be used for identifying third parties: (1) high professional expertise regarding social processes; (2) low power over fate of principals; (3) high control over confrontation setting and processes; (4) moderate knowledge about principals, issues, and background factors; (5) neutrality or balance with respect to substantive outcome, personal relationships, and conflict resolution methodology."

The EDO, as being develcped by the AOS program, is a knowledge utilization person who has up-to-date critical awareness of a vast array of technical resources and who monitors and facilitates their introduction into the organizational system. He works best when he is teamed with an external

consultant (Lippett, 1958; Bennis, 1969; Beckhard, 1969; and Lippett, G., 1969). (The NLHE would assume this role as the office of the EDO is established on campus.) Ideally, the external consultant is more senior in terms of prestige, expertise, respect, and trust than top line officers. The presence of a detached, high-level, external consultant ensures the professionalism of the internal change agent.

Necessary Skills of the EDO. Basic to the EDO is general skill in planned change intervention: Consultation, diagnosis, training, skill in social and organizational functioning, and a high level of self-awareness and self-utilization (Bennis, 1969).

Specifically, his specialities should include the following:

(1) Organization development: Management training; creative problem solving; team building; individual career planning; innovation and change analysis; force field analysis for problem solving; creative risk taking; mutual goal setting; training in participative management; analysis of role relationships; change agent skill training; action-research methods; role playing; case studies.

(2) Organization development and management science: Management-by-objectives, Delphi techniques, campus environment assessment techniques, models for participative governance, community analysis, demography, social problems research.

(3) Management sciences: PERT, PPBS, management information systems, quantitative analysis, scheduling systems, formal simulations and modeling

by computers, student assessment of instructional programs, environmental analysis.

To accomplish the tasks assigned to his office, the EDO must have adequate resources available to him. He should either be responsible for, or have full access to, the Office of Institutional Research or comparable research assistance. Data processing services must be available for his use. In addition he should personally develop expertise in organization development and management science techniques, as indicated above, in evaluation and in assisting the processes of communication and participation among people. He should also be sensitive to the judicious introduction of new kinds of data into the operational mechanisms of the institution.

The EDO should be familiar with the major issues confronting higher education in general and his institution in particular. He should be adept enough to ask the right questions. He should be familiar with the process of developmental planning and decision-making. He should have the skills and resources required to draw upon relevant information from the literature and the latest research and experimentation done on other campuses. Finally, the EDO should have a thorough knowledge of the long-range planning process for colleges and universities.

It should not be necessary to add, parenthetically, that the Laboratory is well aware that such a person is at present extremely difficult to find. Much of the Laboratory's program will involve the location, recruitment, and intensive training of likely candidates. Additional AOS products

include training materials and techniques to help a university establish the EDO on campus.

Representative Planning Group and Action-Research Teams

Recognizing that the business of setting goals and objectives, outlining the purposes, and influencing the functioning of an institution is the concern of all its members, the AOS program involves the implementation of concepts of participative governance. This approach calls for organizational models, policies, and procedures which encourage broad participation in institutional governance as well as strategies for facilitating planned change.

One such strategy is part of a plan developed and successfully employed at St. Louis University, in which a university-wide group was established to formulate comprehensive plans. This committee, an institutional planning group, should include persons who are close to the academic community and are representative of all constituent groups affected by the workings of the institution (Parden, 1969).

Another strategy which encourages participation as it facilitates change is the use of the action research team composed of faculty, students, administrators, and, in some cases, other selected constituent groups. In brief, this team identifies a campus problem and attempts to provide a solution through action-research. The team members gather data relevant to all aspects of the particular problem and devise methods of intervention to improve the existing structure or situation. The importance not only of support but also of active participation of top administrators is emphasized.

The Laboratory is cooperating with the National Training Laboratory for Applied Behavioral Science to study the use of action research teams as a method of producing change on college campuses. This project will result in an action research literature review, a manual on action research, workshops for training members of action research teams, and instruments for assessing college climate characteristics. Evaluative designs will also be developed to determine the impact of action research teams in effecting planned change on the college campus.

The Information Systems Component

Many of the objectives of the Organization Development component depend upon a management information system that incorporates automatic data processing. This is true particularly in reference to information needs of the communication networks, data-based alternatives for appropriate decision-making, and monitoring and evaluation. Consequently, computer-based administrative applications have two purposes in the AOS program: (1) To increase the efficiency and effectiveness of administrative operations, and (2) to provide a readily accessible data base for developing a management information system. The management information system, in turn, exists to integrate and feed back continually reliable information needed for developing and monitoring policies, plans, decisions, and operations.

Probably a majority of colleges use some sort of computer facility to some extent, but rarely in the comprehensive manner to be provided by the AOS program. Many of the

colleges without access to computer facilities can be even further benefited since one objective of the Information System component is to enable these colleges to use the Laboratory's "software" packages through a computer service without having to invest in their own computer facilities. In essence the goal of the Information Systems component is to increase the efficiency of administrative record keeping and the quality of information available for planning, decision-making, and evaluation in colleges of diverse sizes and types.

Since the information requirements of decision-makers will change over time, it is essential that the information systems of the institution be flexible and responsive in accommodating new requirements (NSF 67-15). The system should be structured so that the vast quantities of data available can be reduced into report forms which provide only the minimum information the decision-maker needs to perform his responsibilities well. In addition, the cost of obtaining information must be considered, as well as the value of the information. Thus, efficient procedures can minimize redundant and unnecessary effort in collecting and processing data.

The Information Systems component of the AOS program is designed to support organization development by providing administrators with convenient access to current, accurate, and comprehensive information concerning the resources, processes, and products of the university at various points in time. Without such a system the informed and flexible decision-making necessary to the functioning of an open systems model of

governance for such a complex organization as a major university would be difficult indeed.

The Institutional Research Component

The research-based alternatives for the most appropriate decision-making process prescribed as paramount in the Organization Development component inevitably depend upon consistently having the right information available at the right time. The Information Systems component has as its main function making this information readily available. The effectiveness of data retrieval and communication, however, is dependent upon the inputs and information requests that come from the Institutional Research component. Institutional Research provides the research designs, measurement methods, statistical techniques, and other tools of systematic inquiry needed to carry on a continuous program of directed institutional self-study. One tool of inquiry, for example, that provides significant information and simultaneously facilitates communications and understanding is opinion sampling.

Increased awareness of change, both within and outside the university, can be effected through a continuous systematic institutional research program (Brumbaugh, 1960). Environmental trends and progress toward goals can be assessed only by taking measurements at various points in time and by using reliable methods for measuring change. Evaluation of the effects of innovative approaches requires the collection of pre-assessment as well as post-assessment data.

If an institution is to maintain its perspective, it must have comparative information from other institutions to

provide a normative frame of reference for assessing its position in higher education. There are times when current awareness may be critical to the well-being of the institution, at which time information must be immediately available to decision-makers (Stickler, 1965). At other times, decision-makers need to integrate stated assumptions with data which summarize past experience as a basis for anticipating the probable effects of alternative decisions.

The foundation for educational development and the activities of the Educational Development Officer are based primarily upon institutional research. Goal determination, assessment of the needs and characteristics of constituent groups, and program planning, monitoring, and evaluation are made possible only through institution research.

Indications are, however, that typically institutions rarely understand these functions of institutional research and consequently make no provisions for them. Indications are also that there are very few institutional research officers who have this understanding or the skills to carry out the functions. The goal of the AOS Institutional Research component, therefore, is to facilitate the process of improving institutional evaluation, problem-solving, and program development through the implementation of prerequisite research. Relative to this goal is the development of training programs and materials to upgrade the Office of Institutional Research on campus.

The Information Systems and Institutional Research components may provide outcomes that represent ends in

themselves; at the same time they are essential to the communication network and information required by the Organization Development component.

Summary of the Program

The over-all strategy of the AOS program is to effect planned organizational change that will improve the ability of the university to function appropriately in a changing world. These changes are reflected in a variety of process and outcome measures encompassed in the Organization Development (OD), Information Systems (IS), and Institutional Research (IR) components of the AOS program. It accomplishes reform by acting as an influential and facilitating force upon the internal processes of the university. The program is designed to operate in such a manner that college governance is a unique part of the total system.

Conclusion

In 1962 Sanford brought to the nation's attention the failure of colleges to achieve their own stated goals, to say nothing of over-all educational goals. In the decade since then, student protest has reinforced the urgency of Sanford's prophetic warning. It is, of course, easier to criticize than to change, and many of higher education's most vehement critics are offering no solutions. Even if they were, however, the American academy has a long tradition of resistance to change. Nevertheless, the failure to change has become exceedingly costly. Outmoded forms of sovereignty and antiquated rules lead to chaos on campus (Sanford, 1962; Ikenberry, 1970a;

Wilson, 1965b). Academia needs the kind of innovation and experimentation that will make it organizationally adaptive, not anachronistic. The issue is no longer whether to change, but how. Colleges and universities must change--not only for their well-being but for their very survival.

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APPENDIX

APPENDIX

Administrative and Organizational Systems Products

ORGANIZATION DEVELOPMENT PRODUCTS

- Role Definitions: Educational Development Officer. A monograph defining the concept and professional role of the EDO as part of the AOS approach. To be published in summer 1971.
- Training Package in Deriving Institutional Goal Statements. A set of materials to assist representatives of constituent groups in institutional goal-setting. Includes data and examples from the Institutional Goals Inventory developed by Educational Testing Service. To be field-tested in 1972.
- Training Package in Deriving Measurable Objectives. A set of materials enabling representatives of constituent groups to develop measurable objectives aimed at meeting stated institutional goals. To be field-tested in 1972.
- Planning Guide and Management-by-Objectives Training Package. A manual and supporting materials to aid administrators in the coordinated planning, budgeting, and control of programs. To be completed in November 1971.
- A Review of the Literature on Curricular Change. A review of the literature on curriculum change in higher education. To be completed in 1971.

INSTITUTIONAL RESEARCH PRODUCTS

- Statistical Interface System and Training Manual. A system enabling administrators who lack computer programming skills to employ appropriate computer statistical analysis methods in institutional research and to interpret the results. To be completed in 1974.
- Survey of Institutional Research Needs. A nationwide survey of selected institutional researchers to identify priority needs for research, model development, and training materials. To be completed in 1972.
- North Carolina Board of Higher Education Research Handbook. A collection of successfully completed research studies which will provide institutional researchers with proven problem-solving strategies and serve as a guide in developing further research studies. To be completed in 1972.

INFORMATION SYSTEMS PRODUCTS

- FORTRAN Information Retrieval System. A set of computer programs, with a training manual and practice exercises, enabling administrators to retrieve desired reports from small-scale computing equipment without programmer intervention. To be field-tested in early 1972.
- AUTOCODER Information Retrieval System. A set of computer programs, with a training manual and

practice exercises, enabling administrators to retrieve desired reports from small-scale computing equipment without programmer intervention. To be field-tested 1971.

- 1130 Admissions Information System. A set of programs for use with the FORTRAN Information Retrieval System to provide admissions officers an efficient method of obtaining the information needed to improve admissions decisions. To be field-tested and evaluated in spring 1971.
- University Admissions Information System. Computer programs, specifications, an application manual, and a demonstration data base, all designed to improve admission processes at institutions using IBM 1401 computer. To be completed in March 1971.
- Financial Aid Information System. Specifications, programs, and a demonstration data base for the development of a data management system for student aid applications, grant, loan funds, and audits. For use on the IBM 1401 computer. To be completed in March 1971
- Feasibility Study for Data Management Systems Development. A generalized specification handbook to help analysts develop data management systems by describing and evaluating large- and small-scale systems already in use. To be completed in 1971.

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